SECTION III. OPERATION

16.3.1 **INTRODUCTION**

Automatic thunderstorm sensor operation is controlled by the acquisition control unit (ACU) via the data collection package (DCP) or the single cabinet ASOS (SCA). This section provides turn-on and turnoff procedures and information on operation, checkout, and diagnostic testing of the sensor.

16.3.2 **CONTROLS AND INDICATORS**

The thunderstorm sensor contains maintenance controls and indicators on the power/comm module and electronics module. Descriptions of the test data displayed as part of the system diagnostic test program are provided in Chapter 1. The thunderstorm sensor controls/indicators are illustrated on figures 16.3.1 and 16.3.2 and described in tables 16.3.1 through 16.3.4.

16.3.3 **TURN-ON PROCEDURES**

The thunderstorm sensor is designed for continuous operation and normally remains on at all times, except for maintenance or repair. The sensor turn-on procedures are provided in table 16.3.5.

16.3.4 **CHECKOUT PROCEDURES**

The ACU via the DCP (or the SCA) continuously monitors the thunderstorm sensor diagnostic output for failure indications. If the ACU (SCA) detects a failure, it flags the sensor off-line and enters the appropriate message in the system log. The technician can review the sensor's test data via thunderstorm sensor screen on the OID. For most failures, the diagnostic identifies the faulty field replaceable unit (FRU). If the diagnostic fails to indicate the faulty FRU, the troubleshooting procedures provided in Section V of this chapter should be performed.

The sensor should be powered up only after complete assembly and checkout of all electrical power and communications connections. If the sensor has been disassembled for any reason before the first power-up, then all electrical connections must be remade and checked. Refer to figure 16.3.1 and table 16.3.1 for power/comm module indicators.

16.3.5 **RUNNING DIAGNOSTICS**

The ASOS contains diagnostic pages for the thunderstorm sensor. The diagnostic test can be performed by using an on-demand diagnostic test as explained in Chapter 1.

16.3.6 **NORMAL OPERATING PROCEDURES**

The thunderstorm sensor is in continuous operation under the control of the DCP (SCA). The thunderstorm indications are displayed in the PRESENT WX field on the 1-minute display at the OID.

16.3.7 **TURNOFF PROCEDURES**

The thunderstorm sensor should be turned off for maintenance purposes only using the procedures provided in table 16.3.6.
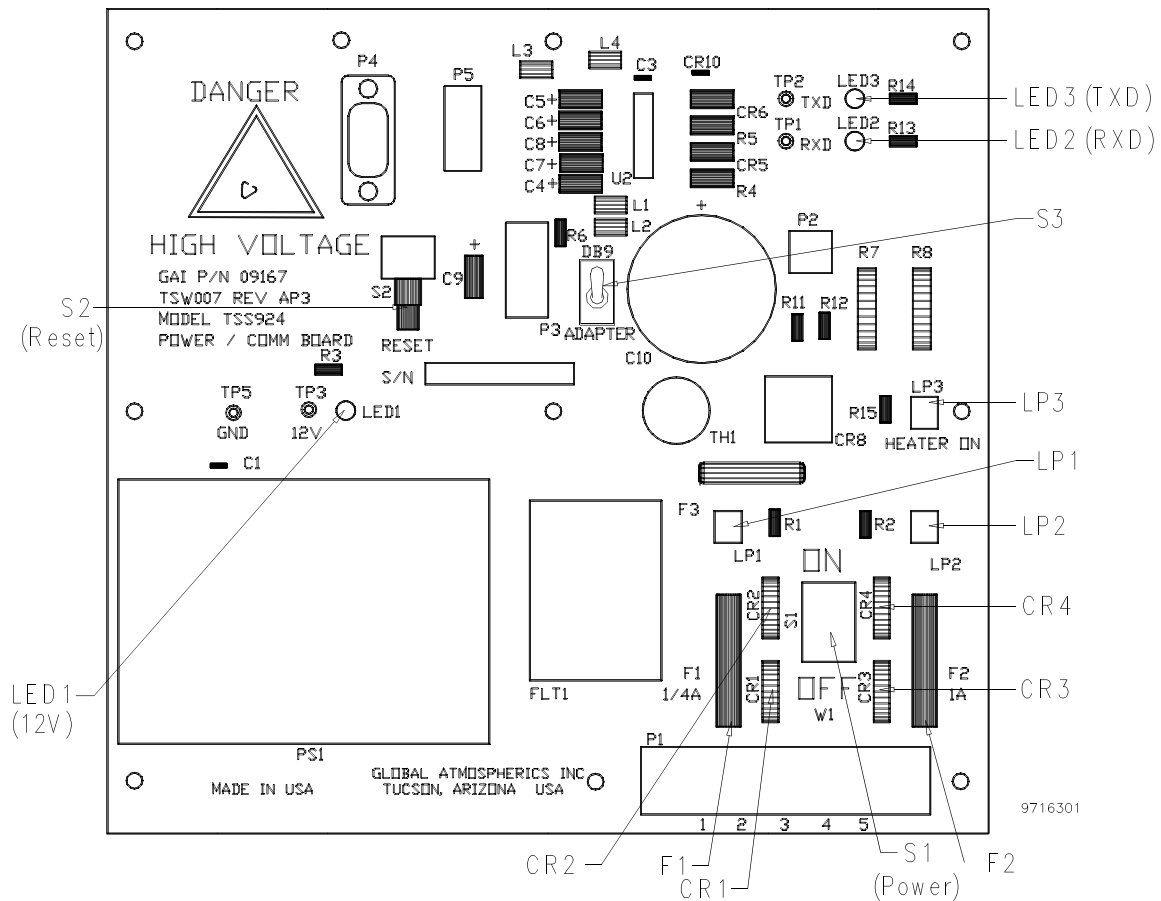
Figure 16.3.1. Power/Comm Module Controls and Indicators

Table 16.3.1. Power/Comm Module Controls and Indicators

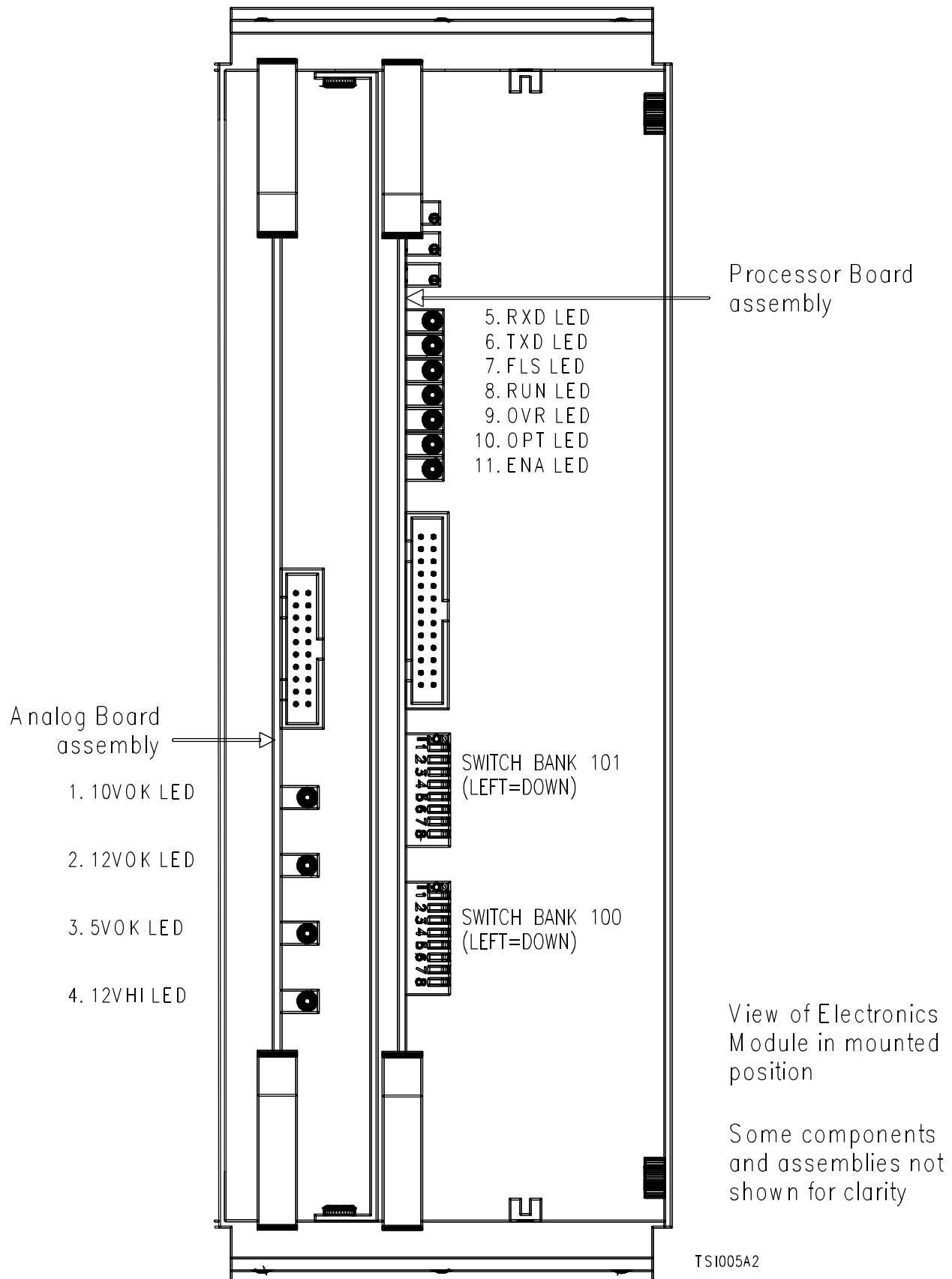| Indicator	Description
CR1-CR4	Transient suppressors (MOV's)
F1	1/4A +12V supply fuse
F2	1A heater fuse
S1	Power switch
S2	Reset switch
S3	Data input select switch (ASOS default is UP, DB9)
LED1	LED indicator that illuminates when 12V is present
LED2	RXD active LED indicator that illuminates when RS-422 data is received from DCP (SCA)
LED3	TXD active LED indicator that illuminates when RS-422 data is transmitted to DCP (SCA)
LP1	Neon lamp status indicator that illuminates when switch S1 is ON, fuse F1 is good, and power is applied to the 12V power supply
LP2	Neon lamp status indicator that illuminates when switch S1 is ON, fuse F2 is good, and power is applied to heater circuit
LP3	Neon lamp status indicator that illuminates when power/comm module temperature is less than 32°F (0°C)

Processor Board
assembly

5. RXD LED
6. TXD LED
7. FLS LED
8. RUN LED
9. OVR LED
10. OPT LED
11. ENA LED

SWITCH BANK 101
(LEFT=DOWN)

SWITCH BANK 100
(LEFT=DOWN)

Analog Board
assembly

1. 10V OK LED

2. 12V OK LED

3. 5V OK LED

4. 12V HI LED

View of Electronics
Module in mounted
position

Some components
and assemblies not
shown for clarity

TSI005A2

Figure 16.3.2. Analog Board and Processor Board Indicators

Table 16.3.2. Analog Board and Processor Board Controls and Indicators

Indicator	Description
ANALOG BOARD INDICATORS	
10VOK	LED indicator illuminated when 10V level is OK
12VOK	LED indicator illuminated when 12V level is OK
5VOK	LED indicator illuminated when 5V level is OK
12VHI	LED indicator illuminated when 12V level is high
PROCESSOR BOARD INDICATORS	
RXD	LED indicator illuminated when processor board receives data from the data/comm board
TXD	LED indicator illuminated when processor board transmits data from the data/comm board
FLS	LED indicator flashes when lightning is detected
RUN	LED indicator illuminated during normal CPU activity
OVR	LED indicator illuminated when there is activity on the overrange signal
OPT	LED indicator illuminated when optical activity is detected
ENA	LED indicator illuminated when electrical activity that enables flash identification is detected

Table 16.3.3. Processor Board Switch Bank 101 Settings

Switch Bank 1	Positions 1 - 8	Output Modes
Pos1	*UP*	VT100 terminal (ASOS required setting)
Pos2	*UP*	One-minute message (ASOS required setting)
Pos3	*UP*	Reserved, always leave up (ASOS required setting)
Pos4	*UP*	Flash message output (ASOS required setting)
Pos5	*UP*	Simulator command set enabled (ASOS required setting)
Pos6	*DOWN*	Host command set enabled (ASOS required setting)
Pos7	*UP*	24-hour history message not cleared (ASOS required setting)
Pos8	*UP*	Reserved, always leave up (ASOS required setting)

Table 16.3.4. Processor Board Switch Bank 100 Settings

Positions 1 2 3			Diagnostic Test
UP	*UP*	*UP*	Normal operation (ASOS required setting)
UP	UP	DN	Self-test @ 1sec
UP	DN	UP	Echo test
UP	DN	DN	Watchdog timeout test
DN	UP	UP	Switch test
DN	UP	DN	Type test
DN	DN	UP	Reserved
DN	DN	DN	Reserved
Position 4			(not defined)
UP			(ASOS required setting)
Positions 5-6			Units of Measure
UP	*UP*		Miles (ASOS required setting)
UP	DN		Nautical miles
DN	UP		Kilometers
DN	DN		Miles
Positions 7- 8			Flash Aging Interval
UP	*UP*		15 minutes (ASOS required setting)
UP	DN		10 minutes
DN	UP		5 minutes
DN	DN		30 minutes

Table 16.3.5. Thunderstorm Sensor Turn-On Procedures

Step	Procedure
	Tools required: No. 2 Phillips screwdriver
1	At DCP (SCA) equipment cabinet, set thunderstorm sensor circuit breaker module to off (right) position.
2	At thunderstorm sensor, use No. 2 Phillips screwdriver to loosen two captive bolts securing hinged sensor access door and open door.
3	At power/comm board, set S1 power switch to ON (up) position.
4	Using No. 2 Phillips screwdriver, close and secure thunderstorm sensor access door.
5	At DCP (SCA), set thunderstorm sensor circuit breakers on circuit breaker module to on (left) position.

Table 16.3.6. Thunderstorm Sensor Turnoff Procedures

Step	Procedure
	Tools required: No. 2 Phillips screwdriver
1	At DCP (SCA) equipment cabinet, set thunderstorm sensor circuit breaker module to off (right) position.
2	At thunderstorm sensor, use No. 2 Phillips screwdriver to loosen two captive bolts securing hinged sensor access door and open door.
3	At power/comm board, set S1 power switch to OFF (down) position.
4	Using No. 2 Phillips screwdriver, close and secure thunderstorm sensor access door.